1. SAVARENSKIY, Ye. F.

2. USSR (600)

"Errors in the Relation Between the Velocity of Longitudinal Waves and Their Depth." Trudy seysmologicheskogo instituta, No. 127, 1948 (39-48)

9. Meteorologiya i Gidrologiya, No. 3, 1949. [redacted] Report U-2551. 30 Oct 52

SAVARENSKIY, YE. F. DOC PHYSICOMATH SCI

Dissertation: "Releasing Angles of Seismic Radiation and Certain Related Problems."

27 Apr 49

Geophysics Inst. Acad Sci USSR

SO Vecheryaya Moskva
Sum 71

1. SAVARENSKIY, Ye. F., KURNOS, D. P.

2. USSR (600)

4. Physics and Mathematics

7. Elements of Seismology and Seismometry, Ye. F. Savarenskiy, D. P. Kurnos. (Moscow-Leningrad, State Technical Press, 1949). Reviewed by Ye. A. Koridalin, Sov. Kniga, No 10, 1950.

9. Report U-3081, 16 Jan. 1953, Unclassified.

SAVARENSKIY, Ye. F.

"Earthquakes, Their Causes and Study." Moscow, 1950.

SAVARENSKIY, Ye. F.

"Tasks of the USSR Seismic Service." Vest. Aka. Nauk SSSR, No 12, 1950, pp 48-53.

SO: U-1345, 5 June 1951.

SAVARENSKIY, YE. F.

Seismometry

On the angle of emergence of seismic radiation and certain related problems. Trudy Geof. inst. AN SSSR 15 (142), 1952.

Monthly List of Russian Accessions, Library of Congress, September 1952. Unclassified.

PA 241T29

SAVARENSKIY, E. F.

USSR/Geophysics - Earthquakes Jan/Feb 53

"The Earthquakes of Turkmen SSR and the Ashkhabad Earthquake of 1948," E. F. Savarenskiy, N. A. Linden and S. I. Masarskiy, Geophys Inst, Acad Sci USSR

"Iz Ak Nauk SSSR, Ser Geofiz" No 1, pp 3-16

Report the results of a study of earthquakes in Turkmen, SSR and of observations of the Ashkhabad earthquake. These investigations were conducted on the basis of observations by the USSR network of seismic stations and by those of other countries. Thank Prof N. I. Nikolayev and I. Ye. Gubin, and senior lab worker S. S. Mebel'.

241T29

SAVARENSKIY, Ye. F. FD 356

USSR/Geophysics - Seismic atlas

Card 1/1

Author : Savarenskiy, Ye. F.

Title : Chronicles: conference on problems concerning the processing of seismic observations and on the compilation of the atlas of seismicity of the USSR

Periodical : Izv. AN SSSR, Ser. geofiz. 2, 202-205, Mar-Apr 1954

Abstract : At the end of the past century many observatories were equipped with horizontal pendulums with large period of natural oscillation. These devices were used to observe the deformation of the earth's sphere under the action of solar-lunar forces. A discussion of the history of such studies. Brief description of reports delivered by Ye. F. Savarenskiy, A. A. Treskov and S. I. Golenetskiy, N. A. Vvedenskaya, Ye. A. Rozova, F. I. Monakhov, M. K. Chernyavkin, V. I. Bune, Ye. I. Byus and A. D. Tskhakay, N. K. Karapetyan

Institution : -

Submitted : -

SAVARENSKIY, Ye.F.

Remarks on the significance of ground conditions for seismic and clinometric observations. Trudy Geofiz.inst. no.22:102-110 '54. (MLRA 8:4)
(Seismology--Observations) (Clinometer)

SAVARENSKIY, Ye.F.

Seismism of the U.S.S.R., results and perspectives of its study. Trudy Geof. inst.no.25:5-24 '54. (MLRA 7:12)
(Seismometry)

USSR/Geophysics - Earthquake focus

Savarenskiy, Ye. F.

Card 1/1 : Pub. 45-2/12

Author : Savarenskiy, Ye. F., and Nenilina, V. S.

Title : Taking account of geological inhomogeneities in the determination of the position of source (focus) of earthquakes

Periodical : Izv. AN SSSR, Ser. geofiz., 17-30, Jan-Feb 1955

Abstract : The authors discuss methods for determining the position of earthquake foci under the condition of establishing the velocities within plane-parallel horizontal layers of the terrestrial crust. They propose a method for taking into account the geological inhomogeneities. This method is applied to certain observations carried out in 1951 by stations of the regional type of the Aralo-Caspian expedition, Academy of Sciences USSR. Four references (e.g. S. I. Golenetskiy and A. A. Treskov, "Method of isochrones," Trudy Geofiz. in-ta AN SSSR, No 21 (148), 1953; "Method of hypocenters," ibid., No 14 (141), 1952).

Institution : Geophysics Institute, Academy of Sciences USSR

Submitted : January 25, 1954

SAVARENSKIY, Ye. F. and KIRNOS, D. P.

"Elements of Seismology and Seismographic Geophysical Exploration," State Publishing House for Technical-Theoretical Literature, Moscow, 1955

This book is a study of elastic waves, the internal constitution of the earth and methods and apparatuses used for seismographic geophysical exploration.

D 362824

SAVARANSKIY, Ye. F.

E. F. SAVARANSKY: "Development of Seismological Service and Analysis of Seismological Observations in USSR."

SO: Soviet Academy of Science Proceedings, No. 6, March Issue 1955; A-40687.

SAVARENSKIY, Ye. F.

USSR/Geophysics - Seismic phenomena

Card 1/1 Pub. 124 - 6/39

Authors : Savarenskiy, Ye. F., Dr. Physico-Math. Sc.

Title : The work of seismographic stations and the tasks of seismology

Periodical : Vest. AN SSSR 25/5, 40 - 43, May 1955

Abstract : An outline is given of the development of the science of seismology in general, showing its ramification into the realm of geology through its role in the formation of mountains and other tectonic features. An account is also given of the development of interest in, and scientific organization for the study of seismic phenomena in the Soviet Union, where 70 stations are in operation. Map.

Institution : .....

Submitted : .....

SAVARENSKIY, Ye.F., doktor fiziko-matematicheskikh nauk.

Development of seismology in the Rumanian People's Republic.
Vest. AN SSSR 25 no.10:74-76 O '55. (MLRA 9:1)
(Rumania--Seismology)

AID P - 3840

Subject : USSR/Meteorology

Card 1/1 Pub. 71-a - 3/35

Authors : Savarenskiy, Ye. F., T. A. Proskuryakova, and V. S. Tsirel'-Spriutson

Title : On the interdependence between microseismic waves and cyclone location over oceans

Periodical : Met. i. gidr., 6, 13-18, N/D 1955

Abstract : Causes of microseismic waves are analyzed. Research over the Atlantic Ocean in the USA and Europe is reported. The ways of determining the position of cyclones by studying the location and direction of microseismic waves are explained. Three diagrams. Two Russian sources, 1912, 1946, 5 English, 1940-1954, and 1 French, 1944.

Institution : None

Submitted : No date

MATORINA, T.V.; OBORINA, S.F.; SAVARENSKIY, Ye.F.

Determination of the velocity of propagation of longitudinal waves in the earth's shell based on observations of deep-seated earthquakes. Trudy Geofiz.inst. no.30:22-29 '55. (MIRA 9:6)
(Waves) (Seismology)

SAVARENSKIY, Ye. F.

"Study of the seismicity of the territory of the USSR", a paper given at the 50th Anniversary Session of the Seismic Station "Pulkovo". 25-29 Sep 1956, Leningrad.

SUM. 1322

124-57-1-564

Translation from: Referativnyy zhurnal, Mekhanika, 1957, Nr 1, p 71 (USSR)

AUTHOR. Savarenskiy, Ye. F.

TITLE The Tsunami Dislocation-wave Problem (Problema tsunami)

PERIODICAL Byul. Soveta po seysmol. AN SSSR, 1956, Nr 2, pp 3-7

ABSTRACT Presentation of general information on the tsunami, the phenomenon of the formation of enormously large waves, with heights attaining and exceeding 30 m. Data on various instances of the formation of tsunamis are adduced, together with descriptions of their destructive effects. For instance, waves 40 m high accompanied the eruption of the volcano Krakatao (1883; in the Sunda Strait - Transl. Ed. Note). Huge devastation, accompanying tsunami phenomena, has wrought great loss of life (up to 30,000 persons). The wave period of tsunami waves is of the order of 10-30 min, their wave-length of the order of 100 km, and the propagation speed 700 km/hr. It is stated that tsunami waves can traverse enormous distances without noticeable reduction of their intensity. Thus, for example, the tsunami waves accompanying the Krakatao explosion were recorded throughout the seven seas. If a tsunami strikes a river bed, a

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The Tsunami Dislocation-wave Problem

ramrod-like wave is formed, which advances upstream and has a powerful impact. It is indicated that not every submarine earthquake is accompanied by tsunami formations. Apparently their formation requires significant dislocations of the profile of the submarine bottom. Several formulas are adduced for the calculation of tsunamis; however, their tentative character is noted, since the impact effect of these waves depends on the submarine topography and a number of other causative circumstances. Various forecasting and warning systems are discussed.

N. N. Moiseyev

1. Water waves--Formation 2. Water waves--Characteristics 3. Earthquakes --Applications 4. Volcanoes--Applications

SAVARENSKIY, Ye.F. ; DZHIBLADZE, E.A.

Seismicity of the Greater Caucasus. Izv.AN SSSR.Ser.geofiz. no.5: 577-583 My '56. (MLRA 9:8)

1. Akademiya nauk SSSR, Geofizicheskiy institut i Akademiya nauk Gruz.SSR, Institut geofiziki.
(Caucasus--Seismometry)

SAVARENSKIY, Ye.F.

Distortions in seismic maps. Izv.AN SSSR Ser.geofiz. no.7:745-754 Jl '56. (MIRA 9:9)

1.Akademiya nauk SSSR, TSentral'naya seysmicheskaya stantsiya "Moskva".
(Caucasus--Seismometry)

SAVARENSKIY, Ye.F.

The third meeting of workers of the European Seismological Committee. Izv.AN SSSR Ser.geofiz. no.7:872-873 Jl '56. (MIRA 9:9)
(Seismology)

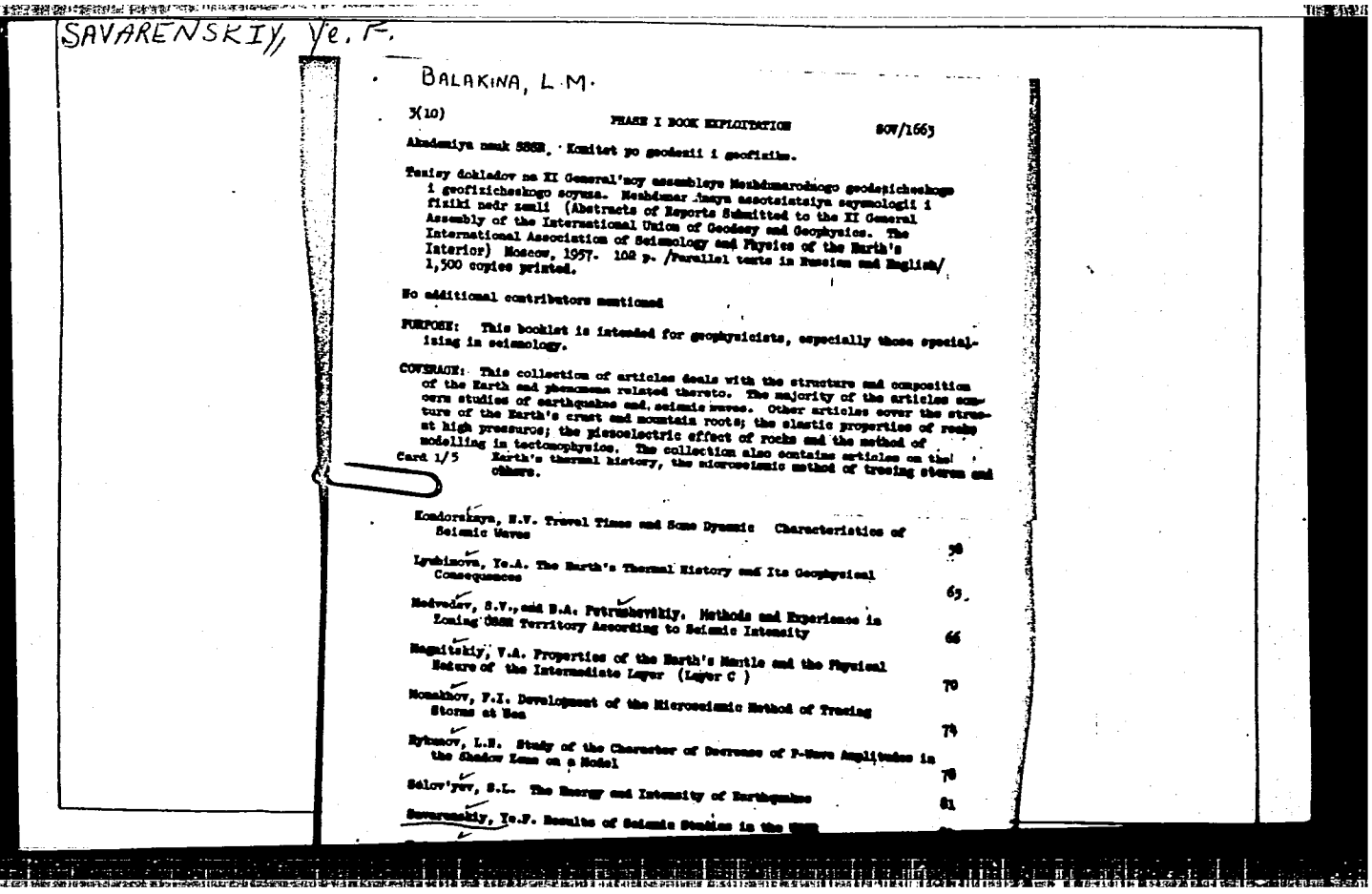
SAVARENSKIY, Ye.F.

Seismic investigations in East European countries during the International Geophysical Year. Izv.AN SSSR Ser.geofiz.no.12:1495 '56. (MIRA 10:10)

(Europe, Eastern--Seismology) (China--Seismology)

SAVARENSKIY, Ye.F., dekter fiziko-matematicheskikh nauk.

Study of the seismicity of almost inaccessible regions; from the program of the International Geophysical Year. Vest.AN SSSR 26 no.6:78-81 Je '56. (MLRA 9:9)
(Arctic regions--Seismology) (Antarctic regions--Seismology)



SAVARENSKIY, Ye. F.

BALAKINA, L. M.

3(10) PHASE I BOOK EXPLOITATION SOV/1663

Akademiya nauk SSSR. Komitet po geodezii i geofizike.

Tezisy dokladov na XI General'noy assamblyee Mezhdunarodnogo geodezicheskogo i geofizicheskogo soyuza. Mezhdunar. assotsiatsiya seysmologii i fiziki nedr zemli (Abstracts of Reports Submitted to the XI General Assembly of the International Union of Geodesy and Geophysics. The International Association of Seismology and Physics of the Earth's Interior) Moscow, 1957. 102 p. /Parallel texts in Russian and English/ 1,500 copies printed.

No additional contributors mentioned

PURPOSE: This booklet is intended for geophysicists, especially those specializing in seismology.

COVERAGE: This collection of articles deals with the structure and composition of the Earth and phenomena related thereto. The majority of the articles concern studies of earthquakes and seismic waves. Other articles cover the structure of the Earth's crust and mountain roots; the elastic properties of rocks at high pressures; the piezoelectric effect of rocks and the method of modelling in tectonophysics. The collection also contains articles on the Earth's thermal history, the microseismic method of tracing storms and others.

Card 1/5

SAVARENSKIY, E. F. (Moscow)

"Report of the Regional Conference in Tokio on Problems of the Geophysical Year."

paper presented at 1st Seismological Conference of the Geophysics Inst. Czechoslavkian Acad. Sci., Liblice, 22 March 1957.

Bergakademi (Berlin) No. 4, 1957.

SAVARENSKIY, Ye.

Seismic studies of inaccessible areas; from the program of the International Geophysical Year. Tr. from the Russian. p. 109.
(Porkroky Matematicky, Fysiky A Astronomie, Vol. 2, no. 1, 1957. Praha, Czechoslovakia)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, no. 10, October 1957 Uncl.

SAVARENSKIY, Ye.F.

Study of seismicity in the U.S.S.R. Biul. Sov. po seism. no.6:16-18 '57. (MIRA 11:3)

1. Institut fiziki Zemli Akademii nauk SSSR, Moskva.
(Earthquakes)

SAVARENSKIY, YE.F

AUTHOR: Savarenskiy, Ye. F. 49-11-3/12

TITLE: Seismology and Seismic Services in the U.S.S.R. During the Last Forty Years. (Seysmologiya i seysmicheskaya sluzhba v SSSR za sorok let).

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1957, No.11, pp.1332-1340 (USSR)

ABSTRACT: The first part of this paper deals predominantly with pre-war developments. Activity in this field in the Soviet Union has been stepped up considerably since the war and there are at present 75 seismic stations of various types, all of which are equipped with new apparatus developed and built in the Soviet Union. The seismic stations are equipped with two types of seismic apparatus with galvanometric recording. Some stations have seismographs with a constant amplification of about one thousand times for a wide range of periods of the seismic waves (from fractions of a sec to 9-10 sec) which record the soil movements during nearby earthquakes with very great accuracy; these also record distant earthquakes and are intended for obtaining material necessary for solving a wide range of seismological problems. Others of these stations are equipped with seismographs with large amplifications

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Seismology and Seismic Services in the U.S.S.R. During the Last Forty Years.

of the seismic stations; this energy was taken as a scale of intensity of the earthquakes. The Atlas is the result of teamwork by the seismologists of the Ac.Sc. USSR and the academies of all the republics affected by earthquakes. The Atlas gives unique material for studying the causes and the conditions of formation of earthquakes and for improving the chart of seismic zoning of the USSR territory. Considerable advances were made in the study of the detailed seismic conditions of individual regions with intensive earthquakes. By means of deep seismic sounding, the structure was determined of the Earth's crust in the regions of Northern Tyan'-Shan, Western Turkmenia, the Pamir-Altai zone and in the Caucasus. The results are of considerable importance in studying the conditions at depth and the causes of tectonic movements, including formation of mountains and seismic activity. At present these methods are used for studying the structure of the highly seismic parts of the Earth's crust in the transient zone between the ocean and the continental structure of the crust (Kurilo-Kamchatka zone). Experimental work on studying the seismic regime and the deep structure of the

Seismology and Seismic Services in the U.S.S.R. During the Last Forty Years.

caused by typhoons and cyclons in the Pacific and Atlantic Oceans. Study of the propagation of elastic waves caused by distant tremors is the main method of investigation of the internal structure of the globe and of its layering. The observations of the Soviet network of seismic stations, which is claimed to be one of the best in the world, is of great importance from the point of view of obtaining factual data on the propagation of seismic waves throughout the globe. The results of recent Soviet work on the layering and the mechanical properties of the shell of the Earth relate to a layer located between the Earth's crust and the core to a depth of 2900 km and also to the core itself. As a result of investigation of the amplitudes of the longitudinal and transverse waves, it was established that in all probability there is no sharp layering or boundaries but relatively continuous changes in the elastic and other mechanical properties in the transient zones. The results of investigations enable evaluation of the sharpness of the boundary of the sub-core at a depth of 5000 km and in this respect it was proved for the first time that there are waves reflected from this boundary.

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AUTHOR: Savarenskiy, Ye.F. 49-12-3/16

TITLE: Work on Seismology in Japan (O rabotakh po seysmologii v Yaponii)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, No. 12, pp. 1453 - 1468 (USSR)

ABSTRACT: The author participated in the West Pacific Regional Conference of the International Geophysical Year in Japan and on this occasion, he visited the Seismological Institute of the Tokyo University [illegible], the Bureau for Seismic Interpretation of the Japanese Meteorological Services [illegible] which control a network of 105 stations, and a number of other establishments. Since most of the results obtained in Japan are published, the author of this article pays attention mainly to the organisation and execution of observations and investigations in the field of seismology, which he reviews in great detail. Para. 1 deals with the organisation of seismological work. Para. 2 deals with the Seismic Division of the Japanese meteorological services. Para. 3 deals with the Seismological Institute of the Tokyo State University. Para. 4 describes the Tokyo Seismic Station of the Japanese Meteorological Services. Para. 5 describes the Abaratubo Seismic

Card1/2

SAVARENSKIY, Ye.F.; DZHIBLADZE, E.A.

Energy of earthquakes in the Greater Caucasus. Soob. AN Gruz. SSR 18 no.1:25-29 Ja '57. (MLRA 10:5)

1. Akademiya nauk Gruzinskoy SSR i Institut geofiziki Tbilisi. Predstavleno akademikom A.I. Dzhanelidze.
(Caucasus--Earthquakes)

SAVARENSKIY, E.F.

The article "Central Seismic Station Moscow," by Prof E. F. Savarenskiy of the Institute of the Physics of the Earth, Academy of Sciences USSR, relates the tasks facing the science of seismology: the explanation of the sources and conditions of the formation of earthquakes; the development of methods for the prevention of the destructive after effects of earthquakes; and the study of the diffusion of oscillations from earthquakes and, on this basis, the study of the structure of the earth.

A description of the apparatus, its operation, the method of interpretation of the recorded results of observations, and the work of the Moscow Seismic Station are set forth.

Included are a map of the seismic zone of the USSR; a seismogram of an earthquake recorded in the Moscow Station as having originated in Greece; a photo showing horizontal and vertical seismographs of the D. P. Kirnos type; a map of the world showing the epicenters of strong earthquakes recorded by the Moscow Station from 1949 to 1955; and a table showing the number of earthquakes recorded by the Moscow Station, monthly over a 20-year period. (Priroda, No 2, Feb 57, pp 54-60) (U)

SUM. 1374

SAVARENSKIY, Ye. F

The following papers were read at the Meeting of the European Seismological Commission in Utrecht, Holland, 8-12 April 1958:

GAL'PERIN, Ye. I. and KOSMINSKAYA, I. P. (Moscow)
"Seismic Investigations of the Deep Crustal Structure According to the IGY Plan."

SAVARENSKIY, Ye. F. (Moscow)
"Determination of Earthquake Magnitude and Intensity in the USSR."

RIZNICHENKO, I. V. (Moscow)
"Quantitative Determination and Mapping of Seismic Activity."

KEYLIS-BOROK, V. I. (Moscow)
"Estimation of Displacement in an Earthquake Source and of Source Dimensions."

KARUS, Ye. V. (Moscow)
"Absorption of Stationary Elastic Vibrations in Rocks."

(five of above authors attended the Conference)

SO: Bergakademie, July 1958, Uncl.

PHASE I BOOK EXPLOITATION SOV/4067

Savarenskiy, Ye.F., Doctor of Physics and Mathematics, V.G. Tishchenko, A.Ye. Svyatlovskiy, A.D. Dobrovol'skiy, and A.V. Zhivago

Tsunami, 4-5 noyabrya 1952 g. (Tsunamis of November 4-5, 1952) Moscow, Izd-vo Akademii nauk SSSR, 1958. 60 p. (Series: Akademiya nauk SSSR. Sovet po seysmologii, Byulleten', no. 4) Errata slip inserted. 1,500 copies printed.

Resp. Ed.: Ye.F. Savarenskiy, Doctor of Physics and Mathematics; Ed. of Publishing House: K.P. Gurov; Tech. Ed.: S.M. Polegitskaya.

PURPOSE: This publication is intended for seismologists, oceanographers, meteorologists and geophysicists.

COVERAGE: This collection contains selected articles from a report prepared jointly by Ye.F. Savarenskiy, A.D. Dobrovol'skiy, V.I. Vlodavets, L.N. Sretenskiy, A.Ye. Svyatlovskiy, A.V. Zhivago, V.G. Tishchenko, and G.A. Skuridin under the auspices of the Academy of Sciences USSR, on a tsunami which hit the Pacific Coast of Kamchatka and the northern Kuril Islands on November 4-5, 1952. The

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articles contain eyewitness accounts, an analysis of the causes and effects, information on the origin, characteristics, structure and trajectory of the tsunami, and the effect of topographic features on various parameters. Source material for the report was obtained from: 1) data of the seismological service; 2) a preliminary report on the Kamchatka earthquake by I.I. Katushenok, B.K. Klimov, F.I. Monakhov, and M.D. Nerchar of the Sakhalin Branch of the Academy of Sciences USSR; 3) the results of investigations at several points on the Kuril-Kamchatka coast by A.Ye. Svyatlovskiy and B.I. Piyp of the Laboratory of Vulcanology, geologist A.N. Rynkova of Yelizovproyekt, and V.G. Tishchenko; 4) data of the hydrometeorological service on the heights of the tsunami waves at different points. The introduction and chapter I were written by Professor Ye.F. Savarenskiy and V.G. Tishchenko of the Geofizicheskiy institut AN SSSR (Geophysical Institute, Academy of Sciences USSR), chapter II by A.Ye. Svyatlovskiy, Candidate of Geology and staff member of the Laboratory of Vulcanology, Academy of Sciences USSR, and chapter III by Professor Dobrovol'skiy of the Institut okeanologii AN SSSR (Institute of Oceanology, Academy of Sciences USSR), and A.V. Zhivago, Candidate of Geography and staff member of the Institut geografii AN SSSR (Institute of Geography, Academy of Sciences USSR). The text contains a map of earthquake epicenters for the Kuril-Kamchatka region compiled by N.A. Linden, Candidate of Physics and Mathematics and member of the Geophysical Institute. There are 12 references: 2 Soviet, 9 English, and 1 German.

SOV-49-58-6-6/12

AUTHOR: Savarenskiy, Ye. F.

TITLE: Seismology in the Chinese Peoples' Republic (O rabotakh po seysmologii v Kitayskoy Narodnoy Respublike)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1958, Nr 6, pp 765-769 (USSR)

ABSTRACT: The author visited the Chinese People's Republic at the end of 1957 and the beginning of 1958, in particular, he went to the Geophysical Institute of the Chinese Academy of Sciences and the seismological stations in Pei-ching, Lan-chou, Hsia-an and Shang-hai. Under the new Five-Year Plan a considerable development in industry and construction work in Central and Western China is required. However, these regions undergo strong earth tremors (e.g. the catastrophic earthquake in Kang , December 16, 1920, which reached an intensity of 8.5 on the accepted scale (Ref.1), and there were 100 000 casualties). Fig.1 gives a map of China, indicating those places where the earth tremors are possible greater than 7 bal. It can be seen that about half China is dangerous in this respect and is only less dangerous than Japan. Obviously, if constructional work, etc., is to be carried out, much research is necessary into the regional seismology. Nearly all the earthquakes in China originate in

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Seismology in the Chinese Peoples' Republic.

the Earth's crust, although owing to the sedimentary deposits, the resultant earth movements are seldom observed directly on the surface. Tectonically, China can be divided into stable regions with bands at their joining points (usually represented by mountain ranges) which represent intense differential motions. The most active is the Himalaya band in the south. To the north of this is the more stable Tibet massif which is bordered on the north by the wide band of the K'un-lun mountains. The Himalayas band and the K'un-lun band approach each other and turn sharply southwards stretching along the meridian into Burma and India. This sharp bend in Eastern Tibet is the most seismologically active place in continental China. The epicentre of the great earthquake (M = 8.6 [Ref.1]) in China and India on August 15, 1950 was traced here. To the north of the K'un-lun mountains is situated the reasonably stable Tarim basin, of which the northern boundary is the Tien Shan belt, stretching from the USSR in the west. This extends into Central China. This was the belt responsible for the 1920

Seismology in the Chinese Peoples' Republic.

earthquake and for another of the same force in 1927 - their epicentres being only 250 km apart. The system of Nan Shan mountains, representing the belt, die away in Shen-hsi where it joins up with an almost meridional system which stretches down to the southern bend of the Himalaya belt. This system is less active and the eastern part of China is a good deal less disturbed seismologically. The island of Formosa is a good deal more active - it belongs to the Pacific island arc. Seismological activity occurs, in general, in transitional zones. The most active mountain ranges in this connection have been analysed in (Ref.3) and are given on the map, which also gives the epicentres of the strongest (>10) earthquakes for the last 50 years (Ref.2). A seismological map of China has now been constructed (Ref.2) under the editorship of Prof. Li Shang-p'ang , using material on earthquakes going back for 3000 years. The accuracy of the map differs for different parts of China owing to differences in data. In the field of engineering seismology the basic aim is to determine the maximum elements of motion: amplitude, velocity and acceleration of oscillation processes and their period distribution spectrum. In this connection, observations on strong earthquakes with comparatively low-

Seismology in the Chinese Peoples' Republic.

sensitivity apparatus are required. However, the establishment of suitable stations would be insufficient, since the network required would be too spaced out to obtain all the necessary data. It is also, of course, essential to determine the elements of motion for weak, but more frequent, earthquakes. In this case the relative magnitude in varying geological conditions is more important than the absolute magnitude and the frequency spectrum must also be determined. It is obviously necessary to employ temporary networks with high-sensitivity instruments in these measurements. Seismological and seismic work in China is under the control of the Geophysical Institute of the Academy of Sciences (CPR) (director - Prof. Chao Chiu-chang). There is a special division for seismology which contains three sub-divisions: (1) a seismic service with a network of stations, (2) study of seismicity, (3) engineering seismology. The first group is the largest. It is again divided into three sub-groups: station control; interpretation; station instrumentation.

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Seismology in the Chinese Peoples' Republic.

At the beginning of 1958 the seismic network consisted of 25 stations (indicated on the map). 15 of the stations are equipped with a single type of three-component apparatus with a recording galvanometer, designed by D. P. Kirnos (or, in some cases, D. A. Kharin). All the apparatus was constructed in China. The remaining stations, together with many of the above, have mechanically registering seismographs (important for large earthquakes). Microseismic stations have been organised in Shang-hai and Kuang-tung. Ten years ago China only had 2 seismic stations and now, apart from Japan, it has the most complete network in Asia. The sub-group employed in interpreting the results issues a monthly bulletin on the observations made. The division for studying seismicity arose in the construction of the seismological map. Its main future tasks will be an increase in accuracy of the above map, a more detailed analysis of tectonic processes connected with earthquakes and an analysis of experimental data obtained. This group maintains contact with the Geological Institute of the Chinese Academy of Sciences and with several historical institutes. The subdivision for engineering seismology was formed recently. It is investigating the results of several destructive earth-

Seismology in the Chinese Peoples' Republic.

quakes, and works in contact with the Institute of Mechanics and the Building Institute of the Academy of Sciences (CPR). Research and construction of seismographs are also undertaken. The seismology group is directed by Prof. Li Shang-p'ang and the engineering seismology group by Hsieh Yu-shou and there is a staff of over a hundred. The Pei-ching seismological station is about 15-20 km from the town. It was built in 1957 and consists of a large building together with an underground cellar 8 m deep and 100 m square. A seismograph (of D. P. Kirnos type) is installed which has period (pendulum and galvanometer) of 12.5 and 1.2 sec; corresponding dampings - 0.45 and 5; magnification horizontally about 2000. For registering weak, near earth tremors a seismograph, type D. A. Kharin, is installed with pendulum and galvanometer periods - 0.8 and 0.4 sec; damping constants - 0.7 and 1.8; magnification - 20 000. In December 1957 seismographs, type B. B. Golitsyn - I. I. Vilip were begun, for registering distant earthquakes. The station employs five men. The Lan Chu seismological station is in Central China close to

Seismology in the Chinese Peoples' Republic.

the epicentres of the 1920 and 1927 earthquakes. The station was organised in 1957, 10-15 km from the town in loess country (Fig.2). The main building has an area of 350 m^2 and is connected to the instruments, which are underground, by a 15 m long corridor. The staff here is also five. D. P. Kirnos and D. A. Kharin apparati have been installed. Owing to the excellent ground conditions the D. A. Kharin apparatus can be used at its maximum magnifications without fear of parasitic oscillations being recorded. This is of interest in the study of the seismology of the Pleistocene rocks. Strong earth tremors are recorded on seismographs with mechanical registration, constructed from two complexes of horizontal seismographs and designed by Prof. Lee Shang-Pang. The smaller model has a magnification of 30 and a period of 3 sec, the larger model has a magnification of 100-120 and a period of 5 sec; neither is damped. In the last two years a branch of the Academy of Sciences (CPR) and several institutes have been built there - very good conditions for scientific work now exist. The Siang seismology station is a part of Siang University and is situated mainly on loess and alluvial deposits with ground water at a small depth. The seismographs are therefore situated in

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the main building (area 200 m^2). Two Lee Shang-Pang horizontal seismographs are installed, together with another having optical recording, electromagnetic damping, a magnification of 560 and a period of 5 sec. There is a staff of one. The Shanghai seismological station is 35 km from the town in the buildings of one of the oldest astronomical observatories in China. It is situated on a small hill (height 100 m) on volcanic rock. It has the following apparatus: (a) a triple component arrangement of seismographs (Golitsyn and Golitsyn-Vilip) for distant earthquakes; (b) a similar arrangement (but D. P. Kirnov's system), vertical magnification - 900, horizontal - 1300; (c) a similar arrangement (but E. Vikhert's system), both horizontal components registered by a pendulum of mass 1200 kg, period 6 sec, damping 1:8 and magnification 200. The vertical seismograph has pendulum of mass 80 kg and period~2 sec; (d) a microseismic stage with three D. P. Kirnos vertical seismographs about 1.5 km from each other. The high humidity interferes with systematic work on microseisms. To increase the number of seismologists, etc.,

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available Pei-ching University in 1957 created a Chair of Physics of the Earth. There are about 20 students at the moment - the professor is the seismologist Fu Ch'en-i. There are 2 figures and 2 Soviet, 2 English references.

ASSOCIATION: Akademiya nauk SSSR, Sovet po seysmologii (Academy of Sciences USSR, Seismology Council)

SUBMITTED: February 28, 1958.

1. Earthquakes--Geophysical effects 2. Seismology--China 3. Disastors --China 4. Geology

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SOV/49-58-8-8/17

AUTHORS: Savarenskiy, Ye.F., Lysenko, L.N. and Kompanets, M.V.

TITLE: Microseisms of Lake Issyk-Kul' as Observed by Seismic Station in Rybach'ye (O mikroseysmakh ozera Issyk-Kul' po nablyudeniyam seysmicheskoy stantsii v Rybach'yem)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1958, Nr 8, pp 1015 - 1019 (USSR)

ABSTRACT: The seismic station Rybach'ye, situated on the west coast of Lake Issyk-Kul', often receives microseisms lasting a short period. Their magnitude rapidly increases with high winds. An example of a typical seismogram registering the microseisms with a diagram showing the wind velocity is shown in Figure 2.
From theoretical considerations, the amplitude of the microseisms can be determined from Eq.(1). It shows that one of the conditions of the microseisms' formation are the standing waves caused by the water waves. These conditions were observed by the station personnel in the course of three years. The standing waves on the lake were observed to develop as a result of a modulation of the advancing wave and reflected from the shore waves (Figure 1).
From the graph (Figure 3) of the amplitude A, period T

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Microseisms of Lake Issyk-Kul' as Observed by Seismic Station in Rybach'ye

and wind velocity V , it can be seen that a lag of about 9 hours between a maximum of the amplitude and that of the wind velocity is formed which can be defined as a relation A = kV (Figure 4). The standing waves caused by the wind depend also on the length of water distance. The relation of the height of water waves H , the velocity of their movement C and the wind stretch F , time of its action t and velocity V was calculated (Figure 6) and compared with the large ocean areas (Figures 5a, b). The results show a close relationship. The amplitude of microseismswas also compared to that of the ocean by evaluating a formula (T) as defined for the ocean conditions and substituting into it the data obtained from the lake (table). It was found that the observed period, 1-3 secs, did not differ much from the theoretical 1.5-3 secs. The amplitude was defined from Eq.(1) as equal to 1.5-2.0 μ .

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Microseisms of Lake Issyk-Kul' as Observed by Seismic Station in Rybach'ye

It is evident from all the data obtained by means of observations and theoretical calculations that the microseisms formed on Lake Issyk-Kul' have a character common to that of the ocean type.
There are 6 figures, 1 table and 5 references, 3 of which are English, 1 Soviet and 1 French.

ASSOCIATION: Akademiya nauk SSSR Institut fiziki Zemli (Ac.Sc. SSSR, Institute of Terrestrial Physics)

SUBMITTED: March 6, 1958

Card 3/3 1 Microseisms--Mathematical analysis

SAVARENSKIY, Ye.F.; RAGIMOV, Sh.S.

Determining the velocity of Rayleigh waves and the direction at the epicenter by three close stations. Dokl. AN Azerb.SSR 14 no. 8:587-594 '58. (MIRA 11:8)

1. Predstavleno akademikom AN AzerSSR M.-A. Kashkayem.
(Seismology)

AUTHOR: Savarenskiy, Ye. F., Doctor of Physical and Mathematical Sciences SOV/30-58-9-2/51

TITLE: Investigation of the Tsunami (Izucheniye tsunami)

PERIODICAL: Vestnik Akademii nauk SSSR, 1958, Nr 9, pp. 11 - 15(USSR)

ABSTRACT: Tsunami is the Japanese technical term for high ocean waves which arise suddenly, mostly on account of earth quakes in the ocean, and reach a height of up to 30m. Nearly every fifth year they cause great catastrophes on different places. This relatively new problem was brought up against the AS USSR in connection with the catastrophe on the Kurilo-Kamchatskiy coast on November 4, and 5, in 1952. At a distance of 1000 kilometers along the coast the average hight of the waves was 7 to 8 m, on some places they for more than 1 km gained upon the land. A lot of settlements were damaged, among them especially Severo-Kuril'sk (Ref 1). All known Tsunami earth quakes since 1737 are shown in reference 1. The elastic seismic waves run quicker than the Tsunami waves. Under USSR conditions this difference is about 10 to 15 minutes. Therefore the danger may be

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Investigation of the Tsunami

recognized in time by observing the seismic waves which announce the Tsunami. Since October 1956 the Tsunami warning in the USSR is a task of the main administration of the Gidrometsluzhba (GUGMS)(Organy Glavnogo upravleniya Gidrometsluzhby (GUGMS)). The AS USSR, namely the Sakhalinskiy kompleksnyy nauchno-issledovatel'skiy institut (General Scientific Research Institute, Sakhalin) has to care for the seismographic record and to determine the epicenters. It was resolved that warning stations should be established in Petropavlovsk, Yuzhno-Sakhalinsk and Kuril'sk. The Institut fiziki Zemli (Institute for Geophysics) was ordered to construct a very preceptible seismic instrument. The AS USSR shall work out a scheme about the dangerous zones. This work was carried out by the Institute of Geophysics, the Morskoy gidrofizicheskiy institut (Sea Institute for Hydrophysics), the Institute of Oceanography and the Sakhalin Institute. At present a variant of such a scheme is worked out and shown in figure 1. Figure 2 shows a seismograph-azimutograph to determine the direction of a strong earth quake and figure 3 shows a seismograph to determine the distance from the epicenter. The Sakhalin Institute and the Institute

for Geophysics compute the quake intensity by which important Tsunamis may be caused. The hydroacoustic observations that determine the pressure wave which originates the Tsunami are called very important for the warning service. There are 3 figures and 1 reference, which is Soviet.

SOV/ 49-58-12-8/17

AUTHORS: Savarenskiy, Ye. F. and Ragimov, Sh. S.

TITLE: The Determination of the Group Velocity and the Bearing of Epicentres, by Rayleigh Waves of 3 Adjacent Stations (Opredeleniye skorosti voln Releya i napravleniya na epitsentr po trem blizkim stantsiyam)

PERIODICAL: Izvestiya akademii nauk SSSR, Seriya geofizicheskaya, 1958, Nr 12, pp 1485-1490 (USSR)

ABSTRACT: By means of the experimental dispersion graphs of the group velocity of the Rayleigh type of waves, it is possible to determine a mean thickness of the earth crust between an epicentre and the observing station. In order to determine the group velocity of the surface waves, it is sufficient to have the data of one station only (Ref.1), but the accuracy of such a determination will be much improved if three different stations situated near each other can combine their observations on the waves which can be considered as a parallel in this condition. An additional advantage of the combined observations is that it is possible to determine an exact bearing of the epicentre by an application of the

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The Determination of the Group Velocity and the Bearing of Epicentres, by Rayleigh Waves of 3 Adjacent Stations

differential method based on the time difference between the first wave of the vibrations of the same type. It is necessary that the instruments of all three stations are identical so that the seismograms are comparable. The investigations were carried out based on the data collected from the three Caucasian stations, Goris, Kirovabad and Shemaha. The magnifications of their seismographs were indicated as static V_{rab} and dynamic U. Thus for the harmonic vibration of:

$$x = A \exp\left(i \frac{2\pi}{\tau} t\right)$$

the instrument registered:

$$y = V_{rab} U(\tau) A \exp\left[i\left(\frac{2\pi}{\tau}(t + \gamma)\tau\right)\right].$$

The dynamical frequency U and the phase characteristic γ was determined by the Eqs.(1) and (2), where T_1 and T_2 -

Card 2/5 periods of seismograph and galvanometer respectively, D_1

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and D_2 - the absorption constants, σ^2 - coefficient of relationship between the seismograph and galvanometer. The constant characteristics of the apparatus are shown in Table 1. The frequency characteristics and the phase displacement with time are shown in Fig.1. In order to determine the group velocity of Rayleigh waves, the seismograms of the vertical seismographs of the three stations were analyzed for the 4 earthquakes, 3 in the area of the Aleutian Islands and 1 in the Kuril Islands. Fig.2 shows the registrations made on the 22 March, 1957, starting at 15 hours, GMT. The details of the earthquakes are shown in Table 2. The determination of the velocity was found by every station (Fig.3). The relationship of the epicentre distance Δ_i and the time difference between the appearance of vibrations and the moment of the earthquake can be taken as a group velocity $C_i(\tau)$, for the given period (Eq.3). The experimental points were plotted (Fig.3),

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which formed a curve (Eq.4). From this equation and the period Eq.(5), the formula (6) can be found. By substituting it in Eq.(3) the relation of group velocity to the period can be expressed as $C_i = C_i(\tau)$. As an example, the data of the earthquake on March 17, 1957, are shown in Fig.4. The values of the group velocities for all 4 earthquakes are shown in Table 3. The azimuth of the epicentres were calculated by various methods. The results of calculations are shown in Table 4. The last row shows the values calculated by the formula (7), where ΔT_{12} and ΔT_{13} - differences between the first vibrations as registered by the three stations (1, 2, 3), $\beta = 57^{\circ}18'$ at the point 1, and $\beta = 90^{\circ}$ at the point 2 (Fig.3, a). It can be stated that the relation of the difference of the epicentral distances to the time difference of the first vibration at the station is equal to the phase velocity of the waves of a given period. This velocity was determined for 2 distant earthquakes: April 14, 1957 in Samoa and July 28, 1957 in South Mexico. The data are shown in Fig.5 as black circles, together with similar

The Determination of the Group Velocity and the Bearing of Epicentres, by Rayleigh Waves of 3 Adjacent Stations

values calculated by other methods (white circles) (Ref.3). The position of the circles indicates that the thickness of the earth crust in the Caucasus is about 50 km. There are 4 tables, 5 figures and 7 references, of which 5 are Soviet and 2 English.

ASSOCIATION: Akademiya nauk SSSR, Institut fiziki Zemli (Academy of Sciences USSR, Institute of Physics of the Earth)

SUBMITTED: April 9, 1958.

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SAVARENSKIY, Ye.F.; AYVAZOV, I.V.

Azimuths and angles of seismic radiation recorded during the earthquakes of April 24 and 25, 1957. Trudy Inst.geofiz.AN Gruz.SSR 17:177-194 '58. (MIRA 13:4)

1. Institut fiziki Zemli AN SSSR, Moskva i Institut geofiziki AN GruzSSR, Tbilisi.
(Seismometry)

SAVARENSKIY, Ye.F.; AYVAZOV, I.V.

Determining the angle of emergence of seismic radiations. Soob. AN Gruz. SSR 20 no. 3:285 289 Mr '58. (MIRA 11:7)

1. AN GruzSSR, Institut geofiziki. Predstavleno akademikom K.S. Zavriyevym.

(Seismic waves)

SAVARENSKIY, Ye. F.

Fourth session of the European Seismological Commission. Vest. AN SSSR 28 no. 7:101 Jl '58. (MIRA 11:7)
(Utrecht, Netherlands--Seismology--Congresses)

VEYTSMAN, P.S. [translator]; VILLER, K.E. [translator]; KROPOTKIN, P.N., red.; SAVARENSKIY, Ye.F., red.; YAKOVENKO, M.Ye., red.; GRIBOVA, M.P., tekhn.red.

[Crustal structure, based on seismic data; collected studies] Stroenie zemnoi kory po seismicheskim dannym; sbornik statei. Moskva, Izd-vo inostr.lit-ry, 1959. 362 p. Translated from the English. (MIRA 13:6)

(Geology) (Seismic prospecting)

SOV/49-59-2-2/25

AUTHOR: Savarenskiy, Ye. F.

TITLE: On the Determination of Apparent Velocity of Seismic Waves in the Caucasus (Ob opredelenii kazhushchikhsya skorostey seysmicheskikh voln na Kavkaze)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geofizicheskaya, 1959, Nr 2, pp 183-188 (USSR)

ABSTRACT: A method of determination of the main waves of P-type for near distances is discussed. The network of stations in the Caucasus region was employed in the investigation. The Earth's crust was considered as composed of two layers, the thickness of which is denoted in calculations as D_1 (granite) and D_2 (basalt) and h - the depth of the focus. The respective velocities are: v_1 ; v_2 while v_3 - below the Mohorovicic discontinuity. The waves considered are: $\overline{P}$, P^* and P, the travel times of which are calculated from Eqs (1-4), where T_o - time of commencement of earthquake. The apparent velocity $\overline{v}$ on the hodographs of these waves is determined by differentiation and is equal to v_2 and v_3 for the waves P^* and

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On the Determination of Apparent Velocity of Seismic Waves in the Caucasus

$\bar{P}$ respectively, while $\bar{v}$ for $\bar{P}$ is equal to:

$$\bar{v} = v_1 \sqrt{1 + \left(\frac{h}{\Delta}\right)^2} \quad .$$

If the epicentric distance and travel time for the hodographs of $\bar{P}$ and P are $\bar{\Delta}$ and $\bar{T} - T_o$, respectively, then the wave $\bar{P}$ will enter first if $\Delta < \bar{\Delta}$ or when $\Delta > \bar{\Delta}$, the wave P will be the first. The wave P^* cannot enter first. The value of $\bar{\Delta}$ is determined from Eqs (1) and (3). Usually, $\bar{\Delta} > 5h$, therefore the expression (5) can be employed when $\bar{\Delta}_o$ corresponds to the focus at the surface ($h = 0$). The point of origin in the hodograph of the wave P is defined from the formula (6). Fig 1, a and 6, illustrates the hodograph and graphs of the apparent velocity (dotted lines correspond to the surface focus, $h = 0$). The apparent velocity in respect to a pair of stations, k and i, can be determined from the formula (7). The mean distance of the epicentre Δ

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is calculated in this case as equal to $(\Delta_k + \Delta_i)/2$. It is possible that both stations receive two different waves and the velocity cannot be determined as shown in Fig 1b . Two possibilities can occur: 1) The station k registers the wave P while the wave $\bar{P}$ enters the station i , or, 2) The station k registers the wave $\bar{P}$ when the station i receives the wave P . The apparent velocity will be found from Eq (9) in the first case and from Eq (10) in the second case. These formulae are obtained from the equality of Eqs (1) and (3) by taking account of Eq (8). As $\Delta_{ki} = \Delta_k - \Delta_i$: the apparent velocity depends on a difference between the epicentric distance of the intersection point of the hodograph $\bar{\Delta}$ and $\Delta = (\Delta_k + \Delta_i)/2$ and on Δ_{ki} . The apparent velocity is determined as the reciprocal of the angle coefficient of the segment ki , in Fig 2a. In the first case the right end of the segment (E) is placed on the hodograph P and $\bar{v} < v_1$ when $\Delta < \bar{\Delta}$ or $\bar{v}$ greater than v_3 when

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$\Delta > \bar{\Delta}$. In the second case $\bar{v} > v_3$ when $\Delta < \bar{\Delta}$ and $\bar{v} < v_1$ when $\Delta > \bar{\Delta}$. In the case of $\Delta = \bar{\Delta}$ the formulae (9) and (10) are equal and $\bar{v}$ is expressed as Eq (11). The graph of $\bar{v}$ represents a number of curves with parameter D_{ki}. The curves are symmetrical in respect to the vertical line 00 ($\Delta = \bar{\Delta}$) corresponding to $\Delta_{ki} = 0$, and they intersect on it at a point defined by the ordinate (11). The straight lines AA and 00 form the 4 quadrants in respect to the wave types entering the stations k and i (Fig 2б). The curves of $\bar{v}$ and the point of intersection move to the right or left when the depth of focus changes. The analysis of the entering times of the seismic waves recorded for the stations in the Caucasus region for the period of 1953 to 1955 (Ref 2) was made. Fig 4 shows the distribution of the earthquakes with their epicentres (1) and the network of stations (2) for that period. The data of the Earth's crust was taken as follows: v_1 = 5.6 km/sec, v_2 = 6.25 km/sec, v_3 = 7.9 km/sec, D_1 = 35 km, D_2 = 15 km. The hodographs were prepared for a

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depth of focus up to 25 km. The graph of the apparent velocity (based on Figs 2a and 6) for the Caucasus region is shown in Fig 3, where the curves for cases 1 and 2 for Δ_{ki} = 50, 100 and 150 km are also included. The numbers indicate the values of Δ_{ki} for the respective experimental points. The greater number of these points are grouped in the lower left and the top right quadrants which shows (according to Fig 2b) the wave P entering a more distant station (k) and the wave $\bar{P}$ being registered by the near station (i). The experimental points evenly distributed in the top left quadrant signify a case when $\Delta < \bar{\Delta}$ and the near stations (i) receive the wave P while the distant ones (k) receive the wave $\bar{P}$. All the experiments described in this

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work require further investigation in order that the exact determination of the apparent velocity can be employed for the observation of seismic waves at distances up to 200 to 300 km. There are 4 figures and 4 Soviet references.

ASSOCIATION: Akademiya nauk SSSR, Institut fiziki Zemli (Academy of Sciences USSR, Institute of Physics of the Earth)

SUBMITTED: June 24, 1957.

S/049/59/000/03/004/019

AUTHORS: Savarenskiy, Ye. F. and Ayvazov, I. V.

TITLE: On the Determination of Azimuth and Emergence Angles of Seismic Radiation

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geofizicheskaya, 1959, Nr 3, pp 372-381 (USSR)

ABSTRACT: An analysis of seismic parameters of longitudinal waves of two earthquakes with one epicentre, 36.0°N, 28.5°E, is given. The earthquakes occurred in 1957 on April 24 at 19 h 10 m 10 sec and on April 25 at 02 h 25 m 33 sec. Fig 1 shows the seismograms of the earthquakes as received in Moscow. The apparent angle e of the ray emergence was found from Eq (1), while the azimuth of the epicentre was determined from Eq (2). Fig 2 illustrates the epicentric distances and the azimuths calculated for different stations. Fig 3 shows a mean value of the angle e calculated for the same stations. Table 3 gives the amplitudes

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On the Determination of Azimuth and Emergence Angles of Seismic Radiation

$A(\Delta)$ observed at different stations, which are also shown in Fig 4 as calculated from Eq (9). Fig 4 indicates that it would be advantageous if seismic stations were more precise in their observations of dynamical parameters. There are 4 figures, 3 tables and 4 references, 3 of which are Soviet and 1 English

ASSOCIATION: Akademiya nauk SSSR, Sovet po seysmologii (Ac. Sc. USSR, Council on Seismology)

SUBMITTED: September 26, 1957

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SAVARENSKIY, Ye.F.

Fourth International Conference of the Hungarian Geophysical Society. Izv. AN SSSR. Ser.geofiz. no.3:502-504 Mr '59. (MIRA 12:4)

(Budapest--Geophysics--Congresses)

SOV/49-59-6-10/21

AUTHORS: Savarenskiy, Ye. F., Sikharulidze, D. I.

TITLE: The Determination of the Thickness of the Earth's Crust from the Recorded Dispersion of Lowe Waves (L_Q)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geofizicheskaya, 1959, Nr 6, pp 880-883 (USSR)

ABSTRACT: Lowe waves (L_Q) recorded at Tbilisi seismic station, used for calculations, showed a high intensity in cases when the station's seismograph axis coincided with the axis of an epicentre. The earthquakes considered are tabulated on p 880. Fig 2 illustrates some recordings of the L_Q waves. The wave velocity was taken as $C_1 = 3.5$ km/sec in the crust, $C_2 = 4.5$ km/sec below it, and the ratio of the medium's densities μ_2/μ_1 was taken as 2 . The earthquakes in the latitudinal direction were divided into two groups: first, with epicentres situated in the Himalayas, Tibet and the Pamirs, second, those situated between 39 and 52°N. The ones in the

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The Determination of the Thickness of the Earth's Crust from the Recorded Dispersion of Lowe Waves (LQ)

meridional direction were grouped in East Africa. The experimental data were compared with the theoretical curves. The results are illustrated in Fig 3, where crosses represent the African group, circles - first group and triangles - second group. The corresponding thickness of the crust were: $H = 55 \pm 5$ km, $H = 45 \pm 5$ km and $H = 35 \pm 5$ km. There are 3 figures, 1 table and 3 references, of which 2 are English and 1 is Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut fiziki Zemli; Akademiya nauk Gruzinskoy SSR, Institut geofiziki (Academy of Sciences USSR, Institute of Physics of the Earth, Academy of Sciences, Georgian SSR, Institute of Geophysics)

SUBMITTED: April 5, 1958.

SOV/49-59-9-8/25

AUTHORS: Savarenskiy, Ye. F. and Ragimov, Sh. S.

TITLE: On the Determination of the Crustal Thickness From the Group Velocity of Rayleigh Waves

PERIODICAL: Izvestiya Akademii nauk, SSSR, Seriya geofizicheskaya, 1959, Nr 9, pp 1364-1367 (USSR)

ABSTRACT: The data of twelve earthquakes tabulated in Tab 1 was used for the determination of the group velocity of Rayleigh waves, the paths of which from the epicentres to the observed stations (Shemakha, Kirovabad and Goris) are illustrated in Fig 1. The parameters of the waves were found to be similar to the phase velocities determined by Press (Ref 3). Fig 2 shows the group velocities of the continental waves (curves 1 to 6) and the sea-bed waves (curve 7). The analysis showed that observed results do not always agree with the theoretical curves and that in the period from 11 to 22 secs some of the observed group velocities were smaller than 2.8km/sec. These discrepancies can be explained by the insufficient accuracy of the measuring methods or by the multi-layer crust. These regions, therefore, were omitted in the calculations which showed the crust thickness of 30 km in the Eastern direction

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On the Determination of the Crustal Thickness From the Group Velocity of Rayleigh Waves

and 45 km in the North Eastern direction from the Caucasus. Fig 3 shows the continental group velocities determined by the various authors whose works are included in Refs 1 to 5. There are 3 figures, 1 table and 5 [illegible] 4 of which are Soviet and 2 English.

ASSOCIATION: Akademiya nauk SSSR. Institut fiziki Zemli (Academy of Sciences, USSR, Institute of Physics of the Earth)

SUBMITTED: January 14, 1959

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Savarenskiy, E.F.

SOV/49-59-10-19/19

AUTHOR: Solov'yev, S. L.

TITLE: Session on Seismology and Tectonics of the Pre-Baikal and the Adjacent Regions

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geofizicheskaya 1959, Nr 10, pp 1527-1528 (USSR)

ABSTRACT: The Session took place on the 9 to 17 June 1959. It was convened by the Council on Seismology, Ac. Sc. USSR; the East Siberian Geological Institute, Ac. Sc. USSR, the Irkutsk State University. It was opened by the Chairman of the East Siberian Seismic Department, Ac. Sc. USSR, Professor V. A. Krotov. The following scientists submitted their papers: A. A. Treskov (Seismic Station Irkutsk) - Seismicity of the Pre-Baikal, N. A. Florensov (East Siberian Geological Institute) - Earthquakes Determined from Excavated Rocks, R. A. Petrushevskiy (Institute of Physics of the Earth, Ac. Sc. USSR) - Geological Development in South Siberia, V. A. Apradov (Moscow University) - Geomorphology and Seismo-Tectonics of Mongolia, I. A. Rezanov (Institute of Physics of the Earth, Ac. Sc. USSR) - Neo-Tectonics

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of the Far East, V. N. Danilovich (Irkutsk Institute of Mining and Metallurgy) - Morphological Peculiarities of the Pre-Baikal, N. P. Ladokhin (East Siberian Geological Institute) - Tectonic Motions of the Bottom of Gulf Proval, V. P. Solonenko and N. A. Florensova (East Siberian Geological Institute) - Foci of Gobi-Altai Earthquakes, S. V. Puchkov and P. I. Khovanova (Institute of Physics of the Earth, Ac. Sc. USSR) - Results of the Pre-Baikal Seismic Expedition, S. L. Solov'yev (Council on Seismology, Ac. Sc. USSR) - Analysis of the Earthquake Chart of the Pre-Baikal, K. V. Pshennikov (Seismic Station Irkutsk) and A. V. Vvedenskaya (Institute of Physics of the Earth, Ac. Sc. USSR) - Motions in the Foci of Strong Baikal Earthquakes, L.M. Balakina (Institute of Physics of Earth, Ac. Sc. USSR) - Motions in the Foci of Gobi-Altai Earthquakes, A. P. Bulmasov (Irkutsk University) - Chart of Magnetic and Gravitational Anomalies of the Pre-Baikal, Ye. K. Grechishchev (East Siberian Geological Institute) - Costal Motions of the Lake Baikal, L. A. Misharina

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(Irkutsk University) A. A. Treskov and G. M. Medvedeva (Seismic Station, Irkutsk) - Seismo-Tectonics of the Pre-Baikal, V. N. Gayskiy (Institute of Seismo-Rigidity of Constructions and Seismology Ac. Sc. Tadzik SSR) - Earth's Crust, V. M. Bigneviga (Sakhalin Scientific Institute, Sakhalin Branch of Ac. Sc. USSR) - Thickness of the Earth's Crust in the Far East, O. N. Solov'yeva, E. F. Savarenskiy and A. P. Lazareva (Institute of Physics of the Earth, Ac. Sc. USSR) - Mean Thickness of the Earth's Crust in the Arctic Sea, - J. P. Chernykh (Seismic Station Petropavlovsk) - Earthquake in Kamchatka on the 4 May 1959, M. G. Arabekov (Institute of Geology, Ac. Sc. Azerbaydzhan SSR) - Fold Formations in Apcheronsk Peninsula, Li Shan'-pan (Institute of Geophysics and Meteorology, Chinese Ac. Sc.) - Seismological Investigations in China, and L. Natsagdus (Committee for Sciences and High Schools, Mongolian Republic) - Tectonics of Central Mongolia. Others who took part in the discussions were Corresponding Members

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of the Ac. Sc. USSR, E. A. Fotiadi and Yu. A. Kosygin, The Director of the East Siberian Geological Institute M. M. Odintsov, and the Deputy Director of the Institute of Physics of the Earth, Ac. Sc. USSR, Ye. A. Koridalin. The Session was closed by the Rector of the Irkutsk University, V. Ya. Rogov.

66304

3.9300 SOV/49-59-11-3/28

AUTHOR: Savarenskiy, Ye. F.

TITLE: On the Determination of the Group and Phase Velocities from Observations

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geofizicheskaya, 1959, Nr 11, pp 1550-1559 (USSR)

ABSTRACT: An account is given of the physical principles and methods of determination of group and phase velocities of surface seismic waves. The interpretation of observations on surface waves is a relatively complicated problem. Moreover, the experimental determination of dispersion curves for group and phase velocities provides information on the mean thickness of the various upper layers of the Earth's surface. It is, therefore, important that persons in charge of seismic stations should have a clear understanding of the principles of determination of surface wave velocities. It is well known that the group velocity C and the phase velocity c for a layer lying on a half-space, are functions of the velocity of propagation of longitudinal and transverse waves, the density, the wave number, and the thickness of the layer. This is expressed by the functions given by Eq (1) in which

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the subscripts 1 and 2 refer to the half-space and the layer, respectively. The actual form of the functions in Eq (1) is complicated. In the case of Love waves the expressions for C and c are somewhat simplified, since in this case the velocities a_1 and a_2 of the longitudinal waves are excluded. Usually one plots out a set of curves C = C(k) and c = c(k) for various h and by comparing these curves with observations a value is obtained for h. For a multi-layered medium this problem is complicated by the presence of additional boundary conditions and the curves depend not on a single parameter h but on a number of parameters, say, h_1, h_2 etc. In the case of the plane problem, the profile of the wave at t = 0 can be represented by the Fourier integral

$$f(x) = \int_{-\infty}^{+\infty} S(k)\, e^{ikx}\, dk$$

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where S(k) is the spectrum of the function f(x) and is given by the equation at the top of p 1551. In the absence of dispersion, the wave would be propagated without change in form. In fact, by replacing x by x - ct, where c is the velocity of propagation, one obtains Eq (2). In the presence of dispersion c will be the phase velocity of the harmonic wave with the wave number k; c will then change with k and Eq (2) will not represent the propagation of the wave without change in the wave-form. In the case of dispersion, the wave-form is given by Eq (3), which represents a sum of harmonic waves but each of the harmonic waves is propagated with a different velocity c(k). These waves will interfere and will extinguish each other except when $\theta = k[x - c(k)t]$ is constant, or almost constant, in an interval of the variable k. These special values of k satisfy the condition given by Eq (4). For large values of x and t, for which S(k) changes slowly compared with the exponential in Eq (3), the wave-form is given by Eq (5), where k_i are the roots of Eq (4) and $A(k_i)$ are given by Eq (6). For

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On the Determination of the Group and Phase Velocities from Observations

simplicity it is assumed that Eq (4) has only one root k_0. In that case the sum given by Eq (5) is replaced by the single cos curve given by Eq (7). Eq (4) may be transformed into the form given by Eq (8), where $C(k_0)$ is the group velocity. The theory is illustrated by the example in which $f(x) = 0$ for $x<0$, $f(x) = \frac{1}{2\pi}$ for $x = 0$, and $f(x) = 0$ for $x>0$. In this case $S(k) = \frac{1}{2\pi}$ and the various other associated quantities are given by Eqs (10) to (13). Table 1 gives a number of values of k_0 for different x/t. If the parameter k_0 is eliminated, then the wave-form is given by Eq (15). Fig 2 shows the corresponding vibrations at distances $x_1 = 40\ \beta/\alpha$ and $x_2 = 80\ \beta/\alpha$. The group velocity can be determined with the aid of Eq (17), where Δ is the epicentral distance and the other symbols are indicated in Fig 3. An account is then given describing in detail how this can be done in practice. The paper ends with an account of the determination of the phase velocity of surface waves from observations. A formula

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On the Determination of the Group and Phase Velocities from Observations

is derived, (Eq (25)) from which this velocity can be calculated. There are 6 figures, 3 tables and 10 references, 6 of which are Soviet and 4 English.

ASSOCIATION: Akademiya nauk SSSR, Institut fiziki Zemli (Academy of Sciences USSR, Institute of Physics of Earth)

SUBMITTED: October 21, 1958

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GOLITSYN, Boris Borisovich [deceased, 1862-1916]; PREDVODITELEV, A.S., otv. red.toma; BOCHKOVSKIY, V.F., prof., red.; GORSHKOV, G.P., prof., red.; KIRNOS, D.P., prof., red.; SAVARENSKIY, Ye.F., prof., red.; SAVARENSKIY, Ye.F., prof., red.; VVEDENSKAYA, A.V., kand.fiz.-mat. nauk, red.; VESHNYAKOV, N.V., kand.fiz.-matem.nauk, red.; LEVITSKAYA, A.Ya., kand.fiz.-matem.nauk, red.; LINDEN, N.A., kand.fiz.-matem. nauk, red.; FILIPPOV, L.P., kand.fiz.-matem.nauk, red.; KHARIN, D.A., kand.fiz.-matem.nauk, red.; ALEKSEYEV, D.M., red.izd-va; MARKOVICH, S.G., tekhn.red.

[Selected works] Izbrannye trudy. Moskva, Izd-vo Akad.nauk SSSR. Vol.1. [Physics] Fizika. 1960. 241 p. (MIRA 13:11)

1.Chlen-korrespondent AN SSSR (for Predvoditelev).
(Physics)

GUBIN, Igor' Yevgen'yevich; SAVARENSKIY, Ye.F., otv.red.; TUGOLESOV, D.A., otv.red.; POPOVA, T.S., red.izd-va; GUS'KOVA, O.M., tekhn.red.

[Mechanisms of seismic phenomena in Tajikistan; geology and seismicity] Zakonomernosti seismicheskikh proiavlenii na territorii Tadzhikistana; geologiia i seismichnost'. Moskva, Izd-vo Akad.nauk SSSR, 1960. 463 p. (MIRA 14:2)

(Tajikistan--Seismology)

GOLITSYN, Boris Borisovich, akademik; BONCHKOVSKIY, V.F., prof., otv.red.II toma; PREDVODITELEV, A.S., otv.red.I toma; GORSHKOV, G.P., prof., red.; KIRNOS, D.P., prof., red.; SAVARENSKIY, Ye.F., prof., red.; VVEDENSKAYA, A.V., kand.nauk, red.; VESHNYAKOV, N.V., kand.nauk, red.; LEVITSKAYA, A.Y., kand.nauk, red.; LINDEN, N.A., kand.nauk, red.; FILIPPOV, L.P., kand.nauk, red.; KHARIN, D.A., kand.nauk, red.; ALEKSEYEV, D.M., red.izd-va; KASHINA, P.S., tekhn.red.

[Selected works] Izbrannye trudy. Moskva, Izd-vo Akad.nauk SSSR. Vol.2. [Seismology] Seismologiia. 1960. 489 p.
(MIRA 13:12)

1. Chlen-korrespondent AN SSSR (for Predvoditelev).
(Seismology)

SAVARENSKIY, Ye. F.

"Studies of Tsunamis in the USSR."

report submitted for the IUGG 12th General Assembly, Intl. Assn. of Meteorology and Atmospheric Physics, Helsinki, 26 July - 6 August 1960.

S/049/60/000/01/016/027
E201/E191

AUTHORS: Savarenskiy, Ye.F., and Mey Shi-Yun

TITLE: The Estimate of Earthquake Intensities in China

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geofizicheskaya, 1960, No 1, pp 135-138

TEXT: About half of China is subject to serious earthquakes (Ref 1) and consequently detailed information on them is of great importance. The first seismic zoning chart was reported earlier (Ref 2), and the present paper continues this work by considering the methods of estimating the earthquake intensities. For this purpose the authors derive theoretically two expressions. The first one gives the depth of the earthquake focus, h, in terms of two measured intensities (I_1, I_2) on S.V. Medvedev's scale (Ref 6) at distances Δ_1 and Δ_2 from the epicentre.

$$I_2 - I_1 = S \log\left(\sqrt{\Delta_1^2 + h^2} / \sqrt{\Delta_2^2 + h^2}\right) \qquad (3)$$

where S is a constant (for China S ≈ 5). The second expression gives the earthquake intensity in terms of the M-scale

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The Estimate of Earthquake Intensities in China

as used in the USSR (Ref 9). The values of M can be found from

$$M = aI_o + b \log H + d \qquad (4)$$

These two expressions were tested on 11 earthquakes since 1918 (their epicentres are shown in Fig 2). Both instrumental data and visual observations of destruction were available for these earthquakes, and they are compared in Table 1. Examples of graphical calculations on these 11 earthquakes are given in Figs 3 and 4. It was found that Eqs (3) and (4) can be used fairly reliably to estimate h and M from historical records at times when no instrumental observations were made. The coefficients in Eq (4) were found to be: a = 2/3, b = 4/5, d = -1/2. With the help of these equations earthquake maps of China can be constructed using historical records.
There are 4 figures, 1 table and 11 references: 9 Soviet and 2 English.

ASSOCIATION: Akademiya nauk SSSR, Institut fiziki zemli (Institute of Physics of the Earth, Ac.Sc. USSR)

S/049/60/000/01/016/027
E201/E191

The Estimate of Earthquake Intensities in China

Akademiya nauk KNR, Institut meteorologii i geofiziki (Institute of Meteorology and Geophysics, Acad. Sci. Chinese People's Republic)

SUBMITTED: January 14, 1959

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S/169/62/000/004/004/103
D228/D302

AUTHORS: Savarenskiy, Ye. F. and Val'dner, N. G.

TITLE: Lg and Rg waves from earthquakes in the Black Sea Basin and some deliberations about their nature

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 4, 1962, 14, abstract 4A106 (V sb. Seysmich. issled., no. 4, M., AN SSSR, 1960, 55-77)

TEXT: Lg and Rg waves were studied, and it is considered whether the Lg_2 wave can possibly be interpreted as a surface wave. Examples are quoted for observations of these waves at the "Moscow" and the "Simferopol" stations. Lg and Rg waves are characterized by rather clear arrivals and are connected both with the change in the period and the increase in the amplitude. In most cases the Lg wave embodies oscillations that are perpendicular to the epicentral direction. The mean Lg_1-wave velocities equal 3.5 + 0.06 km/sec for North America. For Eurasia the Lg_1-wave equals 3.5 ± 0.07 km/sec,

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the Lg_2 wave being 3.37 ± 0.04 km/sec. For California Lg_1 = 3.5 ± 0.07 km/sec. The Rg wave is polarized in the vertical plane and has a vertical and a horizontal (radial) component. It is a Rayleigh-type wave. It is characterized by rapidly increasing amplitudes. The average Rg-velocity values equal 3.05 ± 0.04 km/sec for North America; for Eurasia Rg = 3.07 ± 0.04 km/sec. The records of 73 earthquakes were investigated. It was discovered that the clearest and most intensive arrivals of Lg and Rg waves are observed for most Greek and South European earthquakes. Less sure arrivals were observed for Turkish earthquakes, when the wave path crossed the middle of the Black Sea. In the authors' opinion Lg is a Love wave. In particular, Lg_2 may correspond to the change from the simple to the composite section of the group-velocity dispersion curve (the complex section is characterized by the appearance of short-period oscillations). [Abstracter's note: Complete translation.]

29869
S/169/61/000/009/011/056
D228/D304

9.9865 (also 1327)

AUTHORS: Lin'kov, Ye. M., and Savarenskiy, Ye. F.

TITLE: Device for registering the trajectory of movement during microseismic vibrations

PERIODICAL: Referativnyy zhurnal. Geofizika, no. 9, 1961, 13, abstract 9A104 (V sb. Seysmich. issled. no. 4, M., AN SSSR, 1960, 133-137)

TEXT: A device is described, by means of which the horizontal trajectories of the movement of particles of the earth's surface during the passage of microseisms are converted into electron-pencil vibrations in an electron-ray tube. If stormy microseisms represent on the whole Rayleigh waves, then straight lines or elongated ellipses—whose long axes are directed, like the straight lines, to the region of microseismic stimulation—are drawn on the tube's screen. The device has two identical channels for the two components; each channel contains a preliminary and a final intensifier. Observations made by means of the described device

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Device for registering...

at Pulkova showed that at the time of microseismic storms the trajectories are principally elongated in a NW direction. [Abstracter's note: Complete translation.]

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3.9300
9.9865

S/049/60/000/009/003/004
E201/E191

AUTHORS: Savarenskiy, Ye.F., and Obukhov, G.G.

TITLE: Reproducibility of the Earthquake Intensity Deduced from Surface Waves

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geofizicheskaya, 1960, No. 9, pp.1346-1348

TEXT: The earthquake intensity M is defined as follows. The square of the ratio of the maximum amplitude to the period of earthquake tremors is taken to be proportional to the energy flux of surface waves (Ref.1). The quantity M seems to be sufficiently reproducible: it varies from station to station by 0.2-0.3. Since the M scale is logarithmic, the variations of ±0.3 imply errors of 100% in determination of the energy. This is because surface waves used to determine the energy suffer dispersion and consequently vibrations recorded by various stations may differ considerably. The present paper deals with propagation of earthquake tremors under conditions of velocity dispersion. Surface waves are assumed to be propagated in a plane-parallel layer. To make the M-scale more uniform the authors suggest using a theoretical curve of the type given by Eq.(10) instead of the

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Reproducibility of the Earthquake Intensity Deduced from Surface Waves

usual empirical calibration curve $(A/T)_{max} = f(\Delta)$, where A is the amplitude, T is the period and Δ is the distance from the earthquake epicentre. In this way an allowance can be made for spreading and absorption of surface waves. A correction for the dependence of the period of the strongest tremors on the distance, of the type $T = a\sqrt[3]{\Delta}$, reduces the scatter of M values by about 0.07-0.1.

There are 3 Soviet references.

ASSOCIATION: Akademii nauk SSSR, Institut fiziki zemli (Physics of the Earth Institute, AS USSR)

SUBMITTED: August 14, 1959

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S/169/61/000/010/002/053
D228/D304

AUTHORS: Savarenskiy, Ye. F., Solov'yeva, O. N., and Lazareva, A. P.

TITLE: Dispersion of Rayleigh waves and structure of the crust in the north of Eurasia and in the Atlantic Ocean

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 10, 1961, 3, abstract 10A24 (Byul. Soveta po seysmol. AN SSSR, no. 10, 1960, 168-175)

TEXT: The average thickness of the crust in the North Arctic Ocean, in the north of Eurasia, and in the Atlantic Ocean was determined from the recordings of earthquakes in the north-western part of the Pacific Ocean and in the Atlantic Ocean. The dispersion of the group velocities of Rayleigh waves was investigated from recordings at the Moscow and Pulkovo stations. It was found that the crust's structure in the North Arctic Ocean is the same as in the north of Eurasia--i.e., continental. The

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crust's thickness in these areas is 35 - 40 km, the thicknesses of the "granite" and "basalt" layers being 20 - 25 and 15 - 18 km respectively. The values of the group velocities for the Atlantic Ocean conform to the one-layer model of the crust (H = 25 - 30 km). 21 references. [Abstracter's note: Complete translation.]

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29503
S/049/60/000/011/004/012
D247/D305

Determining the energy...

other authors,

$$E = 2\pi R^2 \rho V \frac{\sin \Delta \operatorname{tg} e}{\frac{de}{d\Delta}} e^{k\Delta} \int_0^{\tau} v^2 \, dt \qquad (1)$$

was used, where R-radius of the earth, ρ --rock density, V--velocity of the propagation of elastic waves, e--angle of emergence, Δ --epicentric distance, k--coefficient of attenuation, τ --the duration of earthquake, v--momentary speed of vibration of incident wave. Following values were accepted: ρ --2.7 gr/cm^3 , V_p--6.2 km/sec. , V_S--3.6 km/sec , R--6370 km , Δ --22^0 , sin Δ tg e/ $\frac{de}{d\Delta}$ --0.36. The results obtained by different equipment are given in a table.

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Determining the energy...

Значения $10^4 \cdot J = \int_0^\tau v^2 dt \cdot 10^4$ в системе CGS с учетом коэффициента увеличения и частотной характеристики приборов

(a) Приборы Голицына, ст. «Москва»			(b) Приборы Кирноса, ст. «Москва»			(c) Приборы Кирноса, ст. МГУ			(d) Энергометр МГУ			
N	Z	E	H_1	Z	H_2	Z	E	N	Z	E	N	
0,26	0,39	0,23	0,1	0,78	0,79 0,82*	1,25 1,35*	0,42	0,91	1,6	1,0	2,1	P_{min}
									3,4	4,9	8,3	P_{max}
0,62	0,25	1,22	0,46	0,45 0,5*	2,13	0,82	1,8	1,5	1,0	3,6	3,8	S_{min}
									4,2	12,4	12,4	S_{max}

Legend to table: The values of $10^4 \cdot J = \int_0^\tau v^2 dt \cdot 10^4$ in the system CGS with due regard for the coefficient of amplification and frequency characteristic of equipment. (a) Golitsyn equipment, Moscow Station; (b) Kirnos equipment, Moscow Station; (c) Kirnos equipment, MGU Station; (d) Energy meter, MGU

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Determining the energy...

There are 4 types of equipment--Golitsyn, Moscow Station; Kirnos, Moscow Station; Kirnos, M.G.U. Station; energy-meter of M.G.U. The results of calculations of the value J by different equipments and components were in agreement. The energy of incident waves was in erg/cm^2 for: P_{min}--170, P_{max}--600, S_{min}--190, S_{max}--670. For calculating the energy of the surface waves

$$E = 2\pi\rho R \sin\Delta \int_0^{\infty} v^2 HVdt \cdot e^{k\Delta} \qquad (3)$$

was used, resulting in a value of E = 15800 erg/cm^2. An attempt was made to determine the value of the energy in the focus of the earthquake. Eqs. (1) and (3) were used with Magnitude = 6.8 . [Abstractor's note: Author gives no explanation for divergence of results]. There are three figures, 1 table and 8 references: 6 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: H. Jeffreys, The Pamir earthquake of 1911,February 18, in relation to

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